

**NOISE-SHIELDING, SWITCH-CONTROLLED LOAD CIRCUITRY
FOR OSCILLATORS AND THE LIKE**

ABSTRACT

5 A set of interconnected delay stages, such as a voltage-controlled oscillator, has switch-
controlled load circuitry connected to each output of each delay stage in the oscillator ring. In one
embodiment, for each delay stage output, the switch-controlled load circuitry includes a switch, a
transistor, and a current source. The switch is connected between the corresponding delay stage output
and the transistor gate, the current source is connected between a power supply and the transistor drain,
10 and the transistor source is connected to ground. In such a configuration, the transistor's gate-to-source
capacitance can be applied to the corresponding delay stage output by closing the switch, for example,
for lower-frequency operations. In addition, the output impedance of the current source decouples the
capacitive load from the power supply, thereby substantially shielding the oscillator ring from noise in
the power supply.